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Geologic structure of the base of the New Albany Shale Group in Illinois

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The New Albany Shale Group structure map (plate 1) is a revised version of the Hunton Limestone Megagroup map published by Stevenson and Whiting (1967). The top of the Hunton Megagroup (Swann and Willman, 1961) is generally the same horizon as the base of the New Albany Shale and has been used previously by Weller (1936) and Bell (1943) in mapping the structure of Illinois. In a study of Devonian and Silurian rocks in central and western Illinois, Whiting and Stevenson (1965) presented a structure map contoured on the top of the Hunton Megagroup; this map was subsequently expanded into their 1967 map.

The northern limit of the mapped area (plate 4) is the northern edge of the top of the New Albany Shale. Although the Hunton Limestone extends some distance north of this line, over most of the area its top is a surface beveled by pre-Pennsylvanian and pre-Pleistocene erosion; therefore, it is unsuitable for structure mapping. The structure contours along the Indiana state line have been matched with a map prepared by the Indiana Geological Survey (Bassett and Hasenmueller, 1979).

The eastern boundary of the mapped area is the Illinois-Indiana Border. The western boundary follows the Mississipi River, except for those places where the New Albany has been removed by erosion (E) or is absent due to non-deposition (A). In extreme southern Illinois, the map extends from a line formed by the Ste. Genevieve Fault and the eroded edge of the New Albany Shale Group to the Ohio River and eastward to the west edge of the Dixon Springs Graben. The southeasternmost portion of Illinois has not been mapped because of the complex faulting and the lack of drill holes penetrating the base of the New Albany Shale (only two exist). The location of these holes and the elevation on the base of the New Albany are shown on the map.

About 4300 data points were used on Stevenson and Whiting's original work map (1967), which was drawn to a scale of 1:250,000. In areas of dense drilling, the control was limited to one point per section. Plate 4 has a scale of 1:500,000, which precludes exact location of data points with symbols of suitable size; therefore, no data points are shown except the two in extreme southern Illinois.

In the area of Hamilton, White, Saline, and Gallatin Counties, the control points are too sparse to provide adequate data for structural interpretation. In these counties, the elevation of the base of the New Albany was estimated by combining maps of the structure of the middle "massive" member (Scottsburg Member) of the Menard Limestone (Siever, 1951; Swann, 1951) and a thickness map of the Menard to Hunton interval (unpublished map).

The sparsely drilled and complexly faulted area south of T. 10 S. in extreme southern Illinois was mapped by relying heavily on structure mapping on shallower horizons (Weller, 1940). The faults shown in this area are essentially the same as those shown on the geological map of Illinois (Willman et al., 1967), with modifications based on work by Ross (1963) and Kolata, Treworgy, and Masters (1981).

Major revisions of Stevenson and Whiting's 1967 map have been made in four areas. The first of these areas is in Lawrence and Crawford Counties, where anticlinal axes along the La Salle Anticlinal Belt were inadvertently shown 6 miles east of their actual location on Stevenson and Whiting's (1967) map. The second area is in the Silurian reef area of southwestern Illinois, which Bristol (1974) mapped in detail, including additional data acquired by drilling since 1967. The third area is in White and Gallatin Counties. Here, detailed mapping of the Wabash Valley Faults by Bristol and Treworgy (1979) resulted in the reinterpretation of the location and extent of several faults. A recent deep test on the Omaha Dome structure (T. 8 S., R. 8 E.) also revealed that the shallow structure is largely the result of igneous intrusions in Mississippian sediments; apparently no structural high exists on the Devonian. The fourth area is in western Franklin County, where the position of the steep flank of the DuQuoin Monocline was shown 4-5 miles east of its actual position on the 1967 edition of this map.

There are a few other minor changes based on scattered deep drilling done for the exploration of oil and gas for gas storage sites (e.g., one at Brubaker Field in Sec. 31, T. 3 N., R. 3 E., Marion County). Most of these changes are not worth noting, since only slight modifications of the 1967 map were required.

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Illinois State Geological Survey

Circular 518—Plate 4 / Illinois Petroleum 121—Plate 1

GEOLOGIC STRUCTURE OF THE BASE OF THE NEW ALBANY SHALE GROUP IN ILLINOIS

by

D. L. Stevenson and L. L. Whiting

1967

Revised by R. M. Cluff and D. L. Stevenson

1981

-200 Contour on base of the New Albany Shale (interval: 100 feet)

Limit of the New Albany Shale

Fault

Cretaceous boundary

A New Albany Shale Group absent

E New Albany Shale Group eroded

New Albany Shale Group outcrop and/or subcrop

New Albany Shale Group subcrop overlain by Pennsylvanian

0 10 20 30 40 50 mi

0 10 20 30 40 50 km

WISCONSIN

IOWA

INDIANA

JO DAVIESS STEPHENSON WINNEBAGO BOONE MC HENRY LAKE

CARROLL OGLE DE KALB KANE COOK

WHITESIDE LEE DU PAGE

HENRY BUREAU KENDALL WILL

LA SALLE

GRUNDY

ROCK ISLAND MERCER PUTNAM KANKAKEE

KNOX STARK MARSHALL LIVINGSTON

WARREN PEORIA WOODFORD IROQUOIS

MC LEAN

HANCOCK MC DONOUGH FULTON FORD VERMILION

TAZEWELL CHAMPAIGN

SCHUYLER MASON LOGAN DE WITT

ADAMS PIATT

BROWN MENARD MACON

PIKE MORGAN SANGAMON CHRISTIAN MOULTRIE DOUGLAS EDGAR

SCOTT SHELBY COLES CLARK

GREENE MACOUPIN MONTGOMERY CUMBERLAND

JERSEY FAYETTE EFFINGHAM JASPER CRAWFORD

MADISON BOND CLAY RICHLAND LAWRENCE

CLINTON MARION

ST. CLAIR WAYNE

WASHINGTON EDWARDS WABASH

MONROE RANDOLPH PERRY FRANKLIN HAMILTON WHITE

JACKSON WILLIAMSON SALINE GALLATIN

UNION JOHNSON

ALEXANDER PULASKI

Wabash Valley Fault System

Cottage Grove Fault System

Ste. Genevieve Fault

Shawneetown Fault Zone

Fluorspar Area Fault Complex

Dixon Springs Graben

91° 90° 89° 88°

42° 41° 40° 39° 38° 37°